Test Report issued under the responsibility of:

TEST REPORT **IS 14286 Series:2023** **Terrestrial photovoltaic (PV) modules – Design qualification and type approval**	
Report Number. ..... :	
Date of issue..... :	
Total number of pages ..... :	
Name of Testing Laboratory preparing the Report ..... :	
Applicant's name ..... :	
Address..... :	
Test specification:	
Standard ..... :	☐ IS 14286 (Part 1):2023 ☐ IS 14286 (Part 2):2023 ☐ IS 14286 (Part 1/Sec 1):2023 ☐ IS 14286 (Part 1/Sec 2):2023 ☐ IS 14286 (Part 1/Sec 3):2023 ☐ IS 14286 (Part 1/Sec 4):2023
Test procedure ..... :	IS 14286 (Part 1):2023 IS 14286 (Part 2):2023
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IS 14286 Series:2023
Test Report Form(s) Originator .... :	BIS
Master TRF ..... :	Dated XXXX-XX-XX
General disclaimer: The test results presented in this report relate only to the object tested.	

Test item description ..... :	
Trade Mark ..... :	
Manufacturer ..... :	
Model/Type reference ..... :	
Ratings ..... :	

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☐	**Testing Laboratory:**		
Testing location/address ..... :			
Tested by (name + signature):			
Approved by (name + signature):			
Issued by (name + signature):			

List of Attachments (including a total number of pages in each attachment):	
	attachment number / number of pages
Installation manual	
Drawings mechanical	
Circuit diagram	
Photographs	
Component datasheets / certificates	
Others:	
Product Description Sheet (Manufacturers and type references)	Annex 1, __ pages
Test table for verifying other stabilization procedure	Annex 2, __ pages
Lower and higher output power modules	Annex 3, __ pages
List of test equipment used	Annex 4, __ pages

Summary of testing:	
Tests performed (name of test and test clause):	**Testing location:**
☐ **The product fulfils the requirements of _____:** **(insert standard number and edition and delete the text in parenthesis, leave it blank or delete the whole sentence, if not applicable)**	

Copy of marking plate:

(Note: The marking plate represents all models covered by this report except for difference in electrical ratings and model designation. See “General product information” for electrical ratings for all models. As there will be other lower wattages to be covered under same report which follows same back label format.)

Test item particulars..... :	
Accessories and detachable parts included in the evaluation..... :	
Mounting system used..... :	
Other options included..... :	
Possible test case verdicts:	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)

Abbreviations used in the report:

P_{max} – Maximum power	HF – Humidity Freeze
V_{mp} – Maximum power voltage	DH – Damp Heat
I_{mp} – Maximum power current	TC – Thermal Cycling
I_{sc} – Short circuit current	α – Current temperature coefficient
V_{oc} – Open circuit voltage	β – Voltage temperature coefficient
FF – Fill factor	δ – power temperature coefficient
STC – Standard Test Conditions (25°C, 1 000 W/m²)	TCO – Transparent conductive oxide TRF – Test report form
MQT – Module Quality Tests	$V_{FMrated}$ – Rated diode(s) forward voltage
VFM – Measured diode(s) forward voltage	NP – Nameplate
P_{max} (Lab) – the measured maximum power of each module	P_{max} (NP) – the minimum rated nameplate power of each module without tolerances
$\bar{P}_{max}$ (Lab) – the arithmetic average of the measured maximum power of the modules	V_{oc} (Lab) – the measured maximum V_{oc}
I_{sc} (Lab) – the measured maximum I_{sc}	V_{oc} (NP) – the maximum rated nameplate V_{oc} of each module without tolerances
I_{sc} (NP) – the maximum rated nameplate I_{sc} without tolerances	P_{max4}(NP) – the maximum rated nameplate power of each lowest power class module, without tolerances
m_1 – the measurement uncertainty in % of laboratory for P_{max}	m_2 – the measurement uncertainty in % of laboratory for V_{oc}
m_3 – the measurement uncertainty in % of laboratory for I_{sc}	t_1 – the manufacturer's rated lower production tolerance in % for P_{max}
t_2 – the manufacturer's rated upper production tolerance in % for V_{oc}	t_3– the manufacturer's rated upper production tolerance in % for I_{sc}
r – P_{max} measurement reproducibility	t_4 – the manufacturer's rated upper production tolerance in % for P_{max4}(NP)
φV_{oc} - open-circuit voltage bifaciality coefficient	φP_{max} - the maximum power bifaciality coefficient
φI_{sc} – the short circuit current bifaciality coefficient	BSI - for stress on bifacial modules, corresponding to 1 000 W/m² on the module front and 300 W/m² on the module rear
BNPI - for bifacial modules, corresponding to 1 000 W/m² on the module front and 135 W/m² on the module rear	RTE – Relative thermal endurance index
RTI – Relative temperature index	
TI – Temperature index	

Testing Dates (YYYY-MM-DD)
Date of first test item received.....:
Dates of tests (beginning/end).....:

GENERAL REMARKS:
Decision Rule: "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a ☐ comma / ☐ point is used as the decimal separator.
When differences exist; they shall be identified in the General product information section.

Name and address of factory ..... :	

PRODUCT ELECTRICAL RATINGS:				
<u>Monofacial Module：</u>				
Module type				
V_{oc} [V] /Tolerance				
V_{mp} [V]				
I_{mp} [Adc]				
I_{sc} [Adc] /Tolerance				
P_{max} [W] /Tolerance				
Maximum system voltage [V]				
Maximum Over-Current Protection Rating [A]				
Note: Further qualification for higher and/or lower output power see annex 3				

Bifacial Module：

	Module type				
STC condition	P_{max} [W] /Tolerance				
	V_{oc} [V] /Tolerance				
	I_{sc} [Adc] /Tolerance				
	V_{mp} [V]				
	I_{mp} [Adc]				
BNPI condition	P_{max} [W] /Tolerance				
	V_{oc} [V] /Tolerance				
	I_{sc} [Adc] /Tolerance				
Bifaciality coefficient	φP_{max}				
	φV_{oc}				
	φI_{sc}				
	Maximum system voltage [V]				
	Maximum Over-Current Protection Rating [A]				

GENERAL PRODUCT INFORMATION AND OTHER REMARKS:

Modifications:

☐ Initial module design qualification

☐ Extension of module design qualification

☐ Original test report ref. No. .....:

Model differences and modification:

☐ Test programs for crystalline silicon PV modules

- ☐ 4.2.1 Modification to frontsheet
- ☐ 4.2.2 Modification to encapsulation system
- ☐ 4.2.3 Modification to cell technology
- ☐ 4.2.4 Modification to cell and string interconnect material or technique
- ☐ 4.2.5 Modification to backsheet
- ☐ 4.2.6 Modification to electrical termination
- ☐ 4.2.7 Modification to bypass diode
- ☐ 4.2.8 Modification to electrical circuitry
- ☐ 4.2.9 Modification to edge sealing
- ☐ 4.2.10 Modification to frame and/or mounting structure
- ☐ 4.2.11 Change in PV module size
- ☐ 4.2.12 Higher or lower output power (by 10 % or more) with the identical design and size and using the identical cell process
- ☐ 4.2.13 Increase of over-current protection rating
- ☐ 4.2.14 Increase of system voltage
- ☐ 4.2.15 Change in cell fixing tape

☐ Test programs for thin-film PV modules

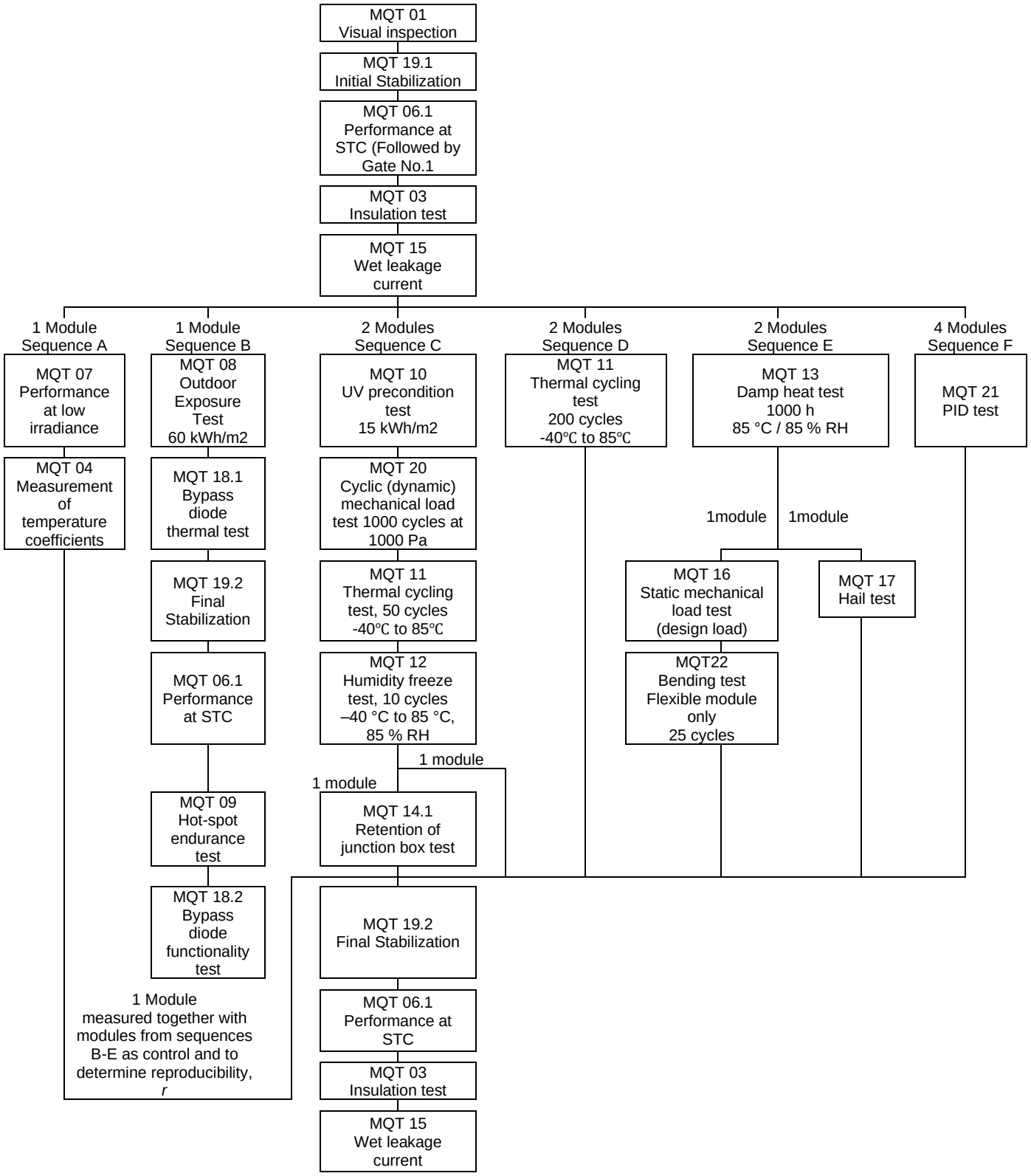
- ☐ 4.3.1 Modification to frontsheet
- ☐ 4.3.2 Modification to encapsulation system
- ☐ 4.3.3 Modification to front contact (e. g. TCO)
- ☐ 4.3.4 Modification to cell technology
- ☐ 4.3.5 Modification to cell layout
- ☐ 4.3.6 Modification to back contact
- ☐ 4.3.7 Modification to edge deletion
- ☐ 4.3.8 Modification to interconnect material or technique
- ☐ 4.3.9 Modification to backsheet
- ☐ 4.3.10 Modification to electrical termination
- ☐ 4.3.11 Modification to bypass diode
- ☐ 4.3.12 Modification to edge sealing
- ☐ 4.3.13 Modification to frame and/or mounting structure
- ☐ 4.3.14 Change in PV module size
- ☐ 4.3.15 Higher or lower output power (by 10 % or more) with the identical design and size
- ☐ 4.3.16 Increase of over-current protection rating
- ☐ 4.3.17 Increase of system voltage

MODULE GROUP ASSIGNMENT:				
Sample #	Sample Group ID	Type/model	Sample S/N	Remark
	A			
	B			
	C1			
	C2			
	D1			
	D2			
	E1			
	E2			
	F1			
	F2			
	F3			
	F4			
Supplementary information: Further qualification for higher and/or lower output power see annex 3				

Note (1) Use the “General product information” field to give any information on model differences within a product type family covered by the test report and to describe the range of electrical and safety ratings, if the TRF covers a type family of modules.

Note (2) Use Annex 1 to list the used materials and components of the module (manufacturer/supplier and type reference).

11	**TEST FLOW (if it is not a full test, strikethrough non-performed test)** Note: Deviations from test sequence are possible, but must be documented.



IS 14286 (Part 1):2023			
Clause	Requirement + Test	Result - Remark	Verdict

5. MARKING AND DOCUMENTATION			
5.1	**Name Plate**		
	All electrical data shall be shown as relative to STC (1 000 W/m^2, 25 °C, AM1.5 according to IEC TS 61836), except for bifacial modules where two irradiance levels are required, 1 000 W/m^2 and BNPI (higher irradiance at which nameplate verification is performed for bifacial modules, corresponding to 1 000 W/m^2 on the module front and 135 W/m^2 on the module rear, applied in any method allowed by IEC TS 60904-1-2).		
	International symbols are used where applicable.		
	The module includes clear and indelible markings:		
	a. Name, registered trade name or registered trade mark of manufacturer		
	b. Type or model number designation		
	c. Serial number (unless marked on other part of product)		
	d. Date and place of manufacture, alternatively serial number allowing to trace the date and place of manufacture;		
	e. Maximum system voltage		
	f. Class of protection against electrical shock		
	g. Voltage at open-circuit or V_{oc} including tolerances. For bifacial modules, open-circuit voltage shall be reported at two irradiance levels. The first required irradiance level is 1 000 W/m2. The second required irradiance is BNPI		
	h. Current at short-circuit or I_{sc} including tolerances. For bifacial modules, short-circuit current shall be reported at two irradiance levels, defined in 5.1g		
	i. Module maximum power or P_{max} including tolerances. For bifacial modules, P_{max} shall be reported at the two irradiance levels, defined in 5.1g		

IS 14286 (Part 1):2023			
Clause	Requirement + Test	Result - Remark	Verdict
	j. For bifacial modules the following information including tolerances, shall be given on the nameplate: The values for the short-circuit current bifaciality coefficient φI_{sc}, the opencircuit voltage bifaciality coefficient φV_{oc}, and the maximum power bifaciality coefficient φP_{max}, measured at STC as defined in IEC TS 60904-1-2		
	k. For flexible modules, the minimum radius of curvature		
5.2	**Documentation**		
5.2.1	Minimum requirements		
	Modules are supplied with documentation describing the methods of electrical and mechanical installation as well as the electrical ratings of the module		
	The documentation states the class of protection against electrical shock under which the module has been qualified and any specific limitations required for that class.		
	The documentation assures that installers and operators receive appropriate and sufficient documentation for safe installation, use, and maintenance of the PV modules.		
5.2.2	Information given in the documentation		
	a. All information required under 5.1 e) to i)		
	b. Overcurrent protection device type and rating are e.g. given in IEC 60269-6		
	Maximum series/parallel module configuration is recommended		
	c. Manufacturer's stated tolerance for V_{oc}, I_{sc} and maximum power output under standard test conditions		
	d. Temperature coefficient for voltage at open-circuit		
	e. Temperature coefficient for maximum power		
	f. Temperature coefficient for short-circuit current		
	All electrical data mentioned above shown as relative to standard test conditions (1 000 W/m^2, 25 °C, AM 1,5 according to IEC TS 61836)		
	g. Performance at low irradiance (MQT 07) is specified		
	International symbols used where applicable		

IS 14286 (Part 1):2023			
Clause	Requirement + Test	Result - Remark	Verdict
	Compliance checked by inspection and MQT 04 through MQT 07		
	The electrical documentation includes a detailed description of the electrical installation wiring method to be used		
	h. The minimum cable diameters for modules intended for field wiring		
	i. Any limitations on wiring methods and wire management that apply to the wiring compartment or box;		
	j. The size, type, material and temperature rating of the conductors to be used		
	k. Type of terminals for field wiring		
	l. Specific PV connector model/types and manufacturer to which the module connectors are mated		
	m. The bonding method(s) to be used (if applicable); all provided or specified hardware is identified in the documentation		
	n. The type and ratings of bypass diode to be used (if applicable)		
	o. limitations to the mounting situation (e.g., slope, orientation, mounting means, cooling)		
	p. A statement indicating the fire rating(s) and the applied standard and the limitations to that rating (e.g., installation slope, sub-structure or other applicable installation information)		
	q. A statement indicating the design load per each mechanical means for securing the module as evaluated during the static mechanical load test according to MQT 16. At discretion of the manufacturer the test load and/or the safety factor γ_m may be noted, too		
	The installation instructions include relevant parameters specified by manufacturer or the following statement or the equivalent: *"Under normal conditions, a photovoltaic module is likely to experience conditions that produce more current and/or voltage than reported at standard test conditions. Accordingly, the values of I_{sc} and V_{oc} marked on this module should be multiplied by a factor of 1,25 when determining component voltage ratings, conductor current ratings, and size of controls connected to the PV output."*		
5.2.3	Assembly instructions		

IS 14286 (Part 1):2023			
Clause	Requirement + Test	Result - Remark	Verdict
	Provided with a product shipped in subassemblies, detailed and adequate to the degree required to facilitate complete and safe assembly of the product		
Supplementary information:			

7. PASS CRITERIA						
7.2	**Power output and electric circuitry**					
7.2.1	Verification of rated label values (Gate No. 1)					
	Manufacturer's tolerances and Laboratory uncertainties					
		t_1	t_2	t_3	t_4	—
	manufacturer's rated lower/upper production tolerance in %					
		m_1	m_2	m_3		
	measurement uncertainty in % of the laboratory					
	Laboratory reproducibility r .....:					
	After stabilization, each individual module meets the requirements					
	P_{max}	See Table 03.1, Table 03.3				
	V_{oc}	See Table 03.1, Table 03.3				
	I_{sc}:.....	See Table 03.1, Table 03.3				
	After stabilization the arithmetic average $\bar{P}_{max}$ $\bar{P}_{max}$ of all modules meet the requirements.	See Table 03.1, Table 03.3				
7.2.2	Maximum power degradation during type approval testing (Gate #2)					
	At the end of each test sequence or for sequence B after bypass diode test, each test sample meets the requirements for P_{max}					
7.2.3	Electrical circuitry					
	Samples do not exhibit an open-circuit during the tests					
7.3	**Visual defects**					
	There is no visual evidence of a major defect.					
7.4	**Electrical safety**					
	The insulation test (MQT 03) requirements are met at the beginning and the end of each sequence					

IS 14286 (Part 1):2023			
Clause	Requirement + Test	Result - Remark	Verdict
	The wet leakage current test (MQT 15) requirements met at the beginning and at the end of each sequence		
	Specific requirements of the individual tests are met		
Supplementary information:			

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict
4. TESTING OVERVIEW			
	Initial examination	All modules	
4.1	Visual inspection (MQT 01)) .....:	See Table 01	
4.19.5	Initial stabilization (MQT 19.1) .....:	See Table 02.1 - 02.4 and Table A.4.1 - A.4.4	
4.6	Performance at STC & BNPI (MQT 06.1)	See Table 03.1 - 03.3 and Tables A.4.7 – A.4.9	
4.3	Insulation test (MQT 03) .....:	See Table 04	
4.15	Wet leakage current test (MQT 15) .....:	See Table 05	
Sequence A	**1 Module**	Sample A	
4.7	Performance at low irradiance (MQT 07).....:	See Table 06.1 - 06.2	
4.4	Measurement of temperature coefficients (MQT 04) .....:	See Table 07	
Sequence B	**1 Module**	Sample B	
4.8	Outdoor exposure test (MQT 08).....:	See Table 08	
4.18.1	Bypass diode thermal test (MQT 18.1)		
	Maximum allowed junction temperature .....:		—
	Calculated junction temperature .....:		—
	Final measurements.....:	See Table 09	
4.18.2	Bypass diode functionality test (MQT 18.2) .....:	See Table 10	
4.19.6	Final stabilization (MQT 19.2).....:	See Table 10.1 – 10.3	
4.9	Hot spot endurance test (MQT 09) .....:	See Table 11	
Sequence C	**2 Modules**	Samples C1; C2	
4.10	UV preconditioning test (MQT 10) .....:	See Table 12.1 - 12.6	
4.20	Cyclic (dynamic) mechanical load test (MQT 20)	See Table 13	
4.11	Thermal cycling test 50 cycles (MQT 11).....:	See Table 14	
4.12	Humidity-freeze test (MQT 12).....:	See Table 15	
Sequence C1	**1 Module**	Sample C1	

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict
4.14.2	Retention of junction box on mounting surface (MQT 14.1) .....:	See Table 16	
4.14.3	Test of cord anchorage (MQT 14.2)		
4.14.3.1	The junction box, separate from the module, shall be tested to IEC 62790 "Test of cord anchorage" and shall meet the requirements therein .....:	See list of attachments	
Sequence D	**2 Modules**	Samples D1; D2	
4.11	Thermal cycling test 200 cycles (MQT 11) .....:	See Table 17	
Sequence E	**2 Modules**	Samples E1; E2	
4.13	Damp heat test (MQT 13) .....:	See Table 18	
4.19.6	Final stabilization (MQT 19.2) .....:	See Table 23.3	
Sequence E1	**1 Module**	Sample E1	
4.16	Static mechanical load test (MQT 16).....:	See Table 19	
4.22	Bending test (MQT 22).....:	See Table 20	
Sequence E2	**1 Module**	Sample E2	
4.17	Hail test (MQT 17)	See Table 21	
Sequence F	**4 Modules**	Samples F1; F2; F3; F4	
4.21	Potential induced degradation test (MQT 21)	See Table 22	
4.19.6	Final stabilization (MQT 19.2) .....:	See Table 23.4, 23.6, 23.7	
	Final measurement	All modules for Sequence C, D, E, F; Control module for Sequence A	
4.19.6	Final stabilization (MQT 19.2) .....:	See Table 23.1 - 23.2	
4.6	Performance at STC&BNPI (MQT 06.1) .....:	See Table 23.5, 23.8	
4.3	Insulation test (MQT 03) .....:	See Table 23.9	
4.15	Wet leakage current test (MQT 15) .....:	See Table 23.10	

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 01: MQT 01 ini: Initial Visual inspection		
Test Date [YYYY-MM-DD]..... :		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 02: MQT 19.1 ini: Initial stabilization							
TABLE 02.1: MQT 06.1 ini: Performance at STC before initial stabilization (Front side)							
Test Date [YYYY-MM-DD] ..... :							—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Supplementary information:							
TABLE 02.2: MQT 06.1 ini: Performance at STC before initial stabilization (Back side)							
Test Date [YYYY-MM-DD] ..... :							—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Supplementary information:							

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 02.3: MQT 06.1 ini: Performance at BNPI (front side irradiance 1 000 W/m^2, back side irradiance 135 W/m^2, 25 °C, AM 1.5) before initial stabilization							
Test Date [YYYY-MM-DD] ..... :							—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Supplementary information:							

TABLE 02.4: MQT 19.1: Initial Stabilization procedure							
Light exposure method ..... :	☐ Solar simulator ☐ Natural sunlight						
Stabilization criterion x per IS 14286 (Part 1/Sec x) . :							
Sample #		Test Date (YYYY-MM-DD) start/end .....:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	(P_{max} – P_{min}) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—

Sample #		Test Date (YYYY-MM-DD) start/end ..... :					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	(P_{max} – P_{min}) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

2							
3							
4						—	—

Sample #		Test Date (YYYY-MM-DD) start/end .....:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	($P_{max} – P_{min}$) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—

Sample #		Test Date (YYYY-MM-DD) start/end .....:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	($P_{max} – P_{min}$) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end .....:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	($P_{max} – P_{min}$) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end ..... :					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	($P_{max} – P_{min}$) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

1							
2							
3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end ....:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	(P_{max} – P_{min}) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end ....:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	(P_{max} – P_{min}) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end ....:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	(P_{max} – P_{min}) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end ....:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	(P_{max} – P_{min}) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

2							
3							
4						—	—

Supplementary information:

☐ Other stabilization procedures

Sample #	Test Date (YYYY-MM-DD) start/end

Test method description:

Supplementary information: see Annex 3 for verification of this alternative stabilization procedure

TABLE 03.1: MQT 06.1 ini: Performance at STC after initial stabilization (Front side)		
Test Date [YYYY-MM-DD]..... :		—
P_{max} lower limit (W) ..... :	See table below: P_{max} [W] – Min calc.	—
$\bar{P}_{max}$ (lab) lower limit (V) ..... :		—
V_{oc}(lab) upper limit (V) ..... :	See table below: V_{oc} [V] Max. calc.	—
I_{sc} (lab) upper limit (A) ..... :	See table below: I_{sc} [A] Max. calc.	—
Test method..... :	☐ Solar simulator ☐ Natural sunlight	—

Sample #	I_{sc} [A]		V_{oc} [V]		I_{mp} [A]	V_{mp} [V]	P_{max} [W]		FF [%]	Result
	Meas.	Max. calc.	Meas.	Max. calc.			Meas.	Min. calc.		

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Average	—								—	
Supplementary information: The limit values are calculated considering manufacturer's tolerances ***t*** of rated nameplate values and laboratory measurement uncertainties ***m***.										

TABLE 03.2: MQT 06.1: Performance at STC after initial stabilization (Back side)										
Test Date [YYYY-MM-DD] ..... :										—
Test method	☐ Solar simulator ☐ Natural sunlight									—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	φI_{sc}	φV_{oc}	φP_{max}	Result
Supplementary information:										

TABLE 03.3: MQT 06.1: Performance at BNPI (front side irradiance 1 000 W/m^2, backside irradiance 135 W/m^2, 25 °C, AM 1.5) after initial stabilization		
Test Date [YYYY-MM-DD] ..... :		—
P_{max} lower limit (W) ..... :	See table below: P_{max} [W] – Min calc.	—
$\bar{P}_{max}$ (lab) lower limit (V) ..... :		—
V_{oc}(lab) upper limit (V) ..... :	See table below: V_{oc} [V] Max. calc.	—
I_{sc} (lab) upper limit (A) ..... :	See table below: I_{sc} [A] Max. calc.	—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight	—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Sample #	I_{sc} [A]		V_{oc} [V]		I_{mp} [A]	V_{mp} [V]	P_{max} [W]		FF [%]	Result
	Meas.	Max. calc.	Meas.	Max. calc.			Meas.	Min. calc.		
Average	—								—	

Supplementary information: The limit values are calculated considering manufacturer's tolerances ***t*** of rated nameplate values and laboratory measurement uncertainties ***m***.

TABLE 04: MQT 03: Initial Insulation test			
Test Date [YYYY-MM-DD].....:			—
Test Voltage applied [V] .....:			—
Size of module [m²] .....:			—
Required Resistance [MΩ].....:			—

Sample #	Measured	Dielectric breakdown		Result
	MΩ	Yes (description)	No	

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict
Supplementary information:			

TABLE 05: MQT 15: Initial Wet leakage current test		
Test Date [YYYY-MM-DD] .....:		—
Test Voltage applied [V] .....:		—
Solution temperature [°C].....:		—
Solution resistivity [Ω cm] .....:		—
Size of module [m²] .....:		—

Sample #	Required Resistance [MΩ]	Measured [MΩ]	Result
Supplementary information:			

TABLE 06.1: MQT 07 - Performance at low irradiance (Front side)			
Test Date [YYYY-MM-DD] ..... :			—
Test method ..:	☐ Outdoor measurement		—
	Ambient air temperature [°C]:		
	Irradiance [W/m^2]:		
	Module temperature [°C]:		
	☐ Data corrected to a 25°C cell temperature and 200 W/m^2 irradiance		
	☐ Directly measured		—

Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]
Supplementary information:						

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 06.2: MQT 07 - Performance at low irradiance (Back side)										
Test Date [YYYY-MM-DD] ..... :										—
Test method ..:	☐ Outdoor measurement									—
	Ambient air temperature [°C]:									
	Irradiance [W/m^2]:									
	Module temperature [°C]:									
	☐ Data corrected to a 25°C cell temperature and 200 W/m^2 irradiance									
	☐ Directly measured									—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	φI_{sc}	φV_{oc}	φP_{max}	
Supplementary information:										

TABLE 07: MQT 04 - Measurement of temperature coefficients				
Test Date [YYYY-MM-DD] .....:				—
Ambient air temperature [°C] high/low .....:				—
Irradiance [W/m^2] high/low.....:				—
Module temperature [°C] high/low.....:				—
Sample #	α [%/°C]	β [%/°C]	δ [%/°C]	—
Supplementary information:				

TABLE 08: MQT 08 - Outdoor exposure test		
Test Date [YYYY-MM-DD] start/end .....:		—
Sample #		
Total irradiation dosage [kWh/m^2] .....:		—
Angle of tilt the test module .....:		—
Electrical load:	☐ Restive load ☐ MPPT	—
Supplementary information:		

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Table 08.1: MQT 01: Visual inspection after outdoor exposure test		
Test Date [YYYY-MM-DD].....:		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

Table 08.2: MQT 15: Wet leakage current test after outdoor exposure test			
Test Date [YYYY-MM-DD] .....:			—
Test Voltage applied [V] .....:			—
Solution temperature [°C] .....:			—
Size of module [m²].....:			—
Solution resistivity [Ω cm].....:			—
Sample #	Measured [MΩ]	Limit [MΩ]	Result
Supplementary information:			

Table 08.3: MQT 02 - Maximum power determination after outdoor exposure test - Optional						
Test Date [YYYY-MM-DD].....:						—
Module temperature [°C].....:						—
Irradiance [W/m²) .....:						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]
Supplementary information:						

Table 08.4: MQT 03 - Insulation test after outdoor exposure test - Optional					
Test Date [YYYY-MM-DD].....:					—
Test Voltage applied [V] .....:					—
Size of module [m²].....:					—
Required Resistance [MΩ].....:					—
Sample #	Measured	Required (MΩ)	Dielectric breakdown		Result
	(MΩ)	(MΩ)	Yes (description)	No	
Supplementary information:					

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 09: MQT 18: Bypass diode thermal test					
Test Date [YYYY-MM-DD] start/end .....:					—
Sample #					—
Module temperature [°C].....:					—
Number of diodes in junction box .....:					—
Diode manufacturer .....:					—
Diode type designation .....:					—
Max. permissible junction temperature, T_{Jmax} [°C] (according to diode datasheet).....:					—
Detailed description of sample preparation procedure .....:					—
Step 1, Determination of V_D versus T_J characteristic					—
	30 ± 2 °C	50 ± 2 °C	70 ± 2 °C	90 ± 2 °C	
Ambient temperature of the junction box ... :					
Pulsed current.....:					
Voltage drop, V_D [V] .....:					
V_D versus T_J characteristic .....:					—
Max. permissible junction temperature T_{Jmax} [°C] (according to diode datasheet) ..... :					
Step 2, Bypass diode thermal test					
	Diode 1	Diode 2	Diode 3		Result
Current flow applied [A] .....:					
Max. diode surface temperature allowed Tj_{max} [°C] :					
Voltage drop, V_D [V] after 1h.....:					
Calculated max. junction temperature Tj_{calc} [°C] ....:					
$T_{Jcalc} < T_{Jmax}$ (test passed)? yes/no .....:					
Current flow (1.25 * I_{sc}) [A] .....:					
Bypass diode remain(s) functional (yes/no) .....:					

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Remarks: See Table 10 for the test details of bypass diode functionality test.

3 Diodes are considered as representative number. These diodes have to be selected as worst case. In case that additional bypass diodes tests are performed the results shall be listed in an attachment.

For bifacial modules, use the value of the short-circuit current at elevated irradiance BSI (equivalent to 1 000 W/m^2 on the front side and 300 W/m^2 on the back side).

Extrapolate Isc-BSI, these quantities are combined as follows: $I_{sc\text{-}BSI}=I_{sc\text{-}BNPI}+(I_{sc\text{-}BNPI}-I_{sc})(G_{BSI}-G_{BNPI})/(G_{BNPI}-1\,000)$, $G_{BSI}=1\,000+300\varphi$, $G_{BNPI}=1\,000+135\varphi$, $\varphi=\mathrm{Min}(\varphi I_{sc}, \varphi P_{max})$

TABLE 09.1: MQT 01 - Visual inspection after bypass diode thermal test		
Test Date [YYYY-MM-DD] ..... :		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 09.2: MQT 15 - Wet leakage current test after bypass diode thermal test			
Test Date [YYYY-MM-DD] ..... :			—
Test Voltage applied [V] ..... :			—
Solution temperature [°C] ..... :			—
Size of module [m²] ..... :			—
Solution resistivity [Ω cm] ..... :			—
Sample #	Measured [MΩ]	Limit [MΩ]	Result
Supplementary information:			

TABLE 09.3: MQT 02 – Max. power determination after bypass diode thermal test - Optional							
Test Date [YYYY-MM-DD] ..... :							—
Module temperature [°C] ..... :							—
Irradiance [W/m^2] ..... :							—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	—
Supplementary information:							

TABLE 09.4: MQT 03 - Insulation test after bypass diode thermal test - Optional		
Test Date [YYYY-MM-DD] ..... :		—
Test Voltage applied [V] ..... :		—
Size of module [m²] ..... :		—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Required Resistance [MΩ]..... :				—
Sample #	Measured	Required	Dielectric breakdown	Result
	MΩ	MΩ	Yes (description) / No	
Supplementary information:				

TABLE 10: MQT 18.2 - Bypass diode functionality test after bypass diode thermal test				
Test Date [YYYY-MM-DD]..... :				—
☐ Method A				—
Ambient temperature [°C] ……..:				—
Current flow applied [A] ……..……:				—
Sample #	VFM	$V_{FMrated}$	VFM = (N × $V_{FMrated}$) ± 10 %	Result
			☐ Yes ☐ No	
Supplementary information:				
☐ Method B				—
	IV curve after shading			Result
Diode 1				
Diode 2				
Diode 3				
Supplementary information:				

TABLE 10.1: MQT 19.1: Final stabilization							
TABLE 10.2: MQT 06.1: Performance at STC before final stabilization							
Test Date [YYYY-MM-DD]..... :							—
Test method..... :	☐ Solar simulator ☐ Natural sunlight						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	—
							—
Supplementary information:							

TABLE 10.3: MQT 19.1 Final Stabilization procedure		
Light exposure method ..... :	☐ Solar simulator ☐ Natural sunlight	—
Stabilization criterion x per IS 14286 (Part 1/Sec x)..... :		—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Sample #		Test Date (YYYY-MM-DD) start/end ..... :					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	$P_{max} – P_{min}$) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Supplementary information:							
☐ Other stabilization procedures							
Sample #		Test Date (YYYY-MM-DD) start/end .....:					
Test method description:							
Supplementary information: See Annex 3 for verification of this alternative stabilization procedure							

TABLE 11: MQT 09 - Hot-spot endurance test		
Test Date [YYYY-MM-DD] start/end .....:		—
Sample #		—
Procedure of technology .....:	☐ wafer-based technologies (WBT) MQT 09.1 ☐ monolithically integrated (MLI) thin film technologies MQT 09.2	—
Cell interconnection circuit .....:	☐ S ☐ SP ☐ PS	—
Type of light source .....:	☐ Pulse solar simulator ☐ Steady state solar simulator ☐ Natural sunlight	—
Module temperature at thermal equilibrium [°C] .:		—

TABLE 11.1: MQT 09 - Hot-spot endurance test for WBT						
Selected hot-spot cells.....:	Low	Low	Low	High	Permanent	—
Shading rate [%].....:						—
Max. measured cell temperature in each cell [°C]:						—
Test duration of each shading [h] .....:						—
Irradiance during shading [W/m²] …… .....:						—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information: For bifacial modules, determination of the cell shading percent and the prolonged exposure are performed at the elevated irradiance BSI. If double-side illumination is used to produce BSI, both the back and the front of the cell are shaded in the same way. During cell selection, any cell that is permanently shaded by a module feature (such as the junction box) is added to the list of selected cells

TABLE 11.2: MQT 09 - Hot-spot endurance test for MLI		
Selected hot-spot cells.....:		—
Number of cells shaded.....:		—
Max. measured cell temperature [°C] .....:		—
Test duration during shading [h] .....:		—
Irradiance during shading [W/m²] …… .....:		—
Supplementary information:		

TABLE 11.3: MQT 01 - Visual inspection after hot-spot endurance test		
Test Date [YYYY-MM-DD].....:		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 11.4: MQT 02 - Maximum power determination after hot-spot endurance test							
Test Date [YYYY-MM-DD].....:							—
Module temperature [°C].....:							—
Irradiance [W/m^2) .....:							—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	—
Supplementary information:							

TABLE 11.5: MQT 02 - Maximum power determination after hot-spot endurance test (at BNPI)							
Test Date [YYYY-MM-DD].....:							—
Module temperature [°C].....:							—
Irradiance [W/m^2) .....:							—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	—
Supplementary information:							

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 11.6: MQT 03 - Insulation test after hot-spot endurance test					
Test Date [YYYY-MM-DD].....:					—
Test Voltage applied [V] .....:					—
Size of module [m²] .....:					—
Required Resistance [MΩ].....:					—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	

TABLE 11.7: MQT 15 - Wet leakage current test after hot-spot endurance test			
Test Date [YYYY-MM-DD].....:			—
Test Voltage applied [V] .....:			—
Solution temperature [°C].....:			—
Size of module [m²] .....:			—
Solution resistivity [Ω cm].....:			—
Sample #	Measured [MΩ]	Limit [MΩ]	Result
Supplementary information:			

TABLE 11.8: MQT 18.2 - Bypass diode functionality test after Hot-spot endurance test				
Test Date [YYYY-MM-DD].....:				—
☐ Method A				—
Ambient temperature [°C] .....:				—
Current flow applied [A] .....:				—
Sample #	VFM	$V_{FMrated}$	VFM = (N × $V_{FMrated}$) ± 10 %	Result
			☐ Yes ☐ No	
Supplementary information:				
☐ Method B				—
	IV curve after shading			Result
Diode 1				
Diode 2				
Diode 3				
Supplementary information:				

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 12.1: MQT 10 - UV preconditioning test (Front side)		
Test Date (YYYY-MM-DD) start/end.....:		—
Module temperature [°C] ..... :		—
UV irradiance (280-400nm) [W/m²] ..... :		—
UV dose (280-320nm) [kWh/ m²] ..... :		—
Module operation condition .....:	☐ Short circuited ☐ Open circuited	—
Supplementary information:		

TABLE 12.2: MQT 10 - UV preconditioning test (Back side)		
Test Date (YYYY-MM-DD) start/end.....:		—
Module temperature [°C] ..... :		—
UV irradiance (280-400nm) [W/m²] ..... :		—
UV dose (280-320nm) [kWh/ m²] ..... :		—
Module operation condition .....:	☐ Short circuited ☐ Open circuited	—
Supplementary information: For bifacial modules repeat the procedure of UV irradiation on the rear-side of the modules.		

TABLE 12.3: MQT 01 - Visual inspection after UV preconditioning test		
Test Date [YYYY-MM-DD].....:		—
Sample #	Nature and position of initial findings – comments or attach photos	—

TABLE 12.4: MQT 15 - Wet leakage current test after UV preconditioning test			
Test Date [YYYY-MM-DD]..... :			—
Test Voltage applied [V] ..... :			—
Solution temperature [°C].....:			—
Size of module [m²] ..... :			—
Solution resistivity [Ω cm]..... :			—
Sample #	Measured [MΩ]	Required Resistance [MΩ]	Result
Supplementary information:			

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 12.5: MQT 02 – Max. power determination after UV preconditioning test - Optional							
Test Date [YYYY-MM-DD].....:							—
Module temperature [°C].....:							—
Irradiance [W/m²].....:							—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Supplementary information:							

TABLE 12.6: MQT 03 - Insulation test after UV preconditioning test - Optional					
Test Date [YYYY-MM-DD].....:					—
Test Voltage applied [V] .....:					—
Size of module [m²] .....:					—
Required Resistance [MΩ].....:					—
Sample #	Measured		Dielectric breakdown		Result
	[MΩ]		Yes (description)	No	
Supplementary information:					

TABLE 13: MQT 20 - Cyclic (dynamic) mechanical Load test		
Test Date [MM/DD/YYYY]…….....:		—
Sample #		—
Temperature of tested module(°C):		—
Maximum pressure (Pa) :		—
Pressure tolerance(Pa) :		—
Monitoring current (A) :		—
Rate per minute(cycles) :		—
Number of cycles …….:		—
Pressure provider (Air pressure or vacuum)……..:		—
Cell and alive part broken/ not		
Current continuous (continuous/ disconnection occurred)		
Supplementary information:N/A		

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 13.1: MQT 01 - Visual inspection after Cyclic (dynamic) mechanical Load test		
Test Date [YYYY-MM-DD].....:		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 13.2: MQT 15 - Wet leakage current test after Cyclic (dynamic) mechanical Load test			
Test Date [YYYY-MM-DD]..... :			—
Test Voltage applied [V] ..... :			—
Solution temperature [°C] ……..:			—
Size of module [m²] ..... :			—
Solution resistivity [Ω cm] ……..:			—
Sample #	Measured [MΩ]	Required Resistance [MΩ]	Result
Supplementary information:			

TABLE 14: MQT 11 - Thermal cycling 50 test			
Test Date [YYYY-MM-DD] start/end ..... :			—
Total cycles (50).....:			—
Weight attached (N) .....:			—
Applied current (A) .....:	During the heat up cycle from 40 °C to 80 °C		—
	Other stages		—
Dwell time at high temperature……..:			
Dwell time at low temperature……:			
Sample #	Open circuits (yes/no)		—
Supplementary information:			

TABLE 14.1: MQT 01 - Visual inspection after thermal cycling 50 test		
Test Date [YYYY-MM-DD].....:		—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 14.2: MQT 15 - Wet leakage current test after thermal cycling 50 test			
Test Date [YYYY-MM-DD]..... :			—
Test Voltage applied [V] ..... :			—
Solution temperature [°C] ……..:			—
Size of module [m²] ..... :			—
Solution resistivity [Ω cm] ……..:			—
Sample #	Measured [MΩ]	Required Resistance [MΩ]	Result
Supplementary information:			

TABLE 14.3: MQT 03 – Max. power determination after thermal cycling 50 test - Optional						
Test Date [YYYY-MM-DD].....:						—
Module temperature [°C].....:						—
Irradiance [W/m²) .....:						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]
Supplementary information:						

TABLE 14.4: MQT 03 - Insulation test after thermal cycling 50 test - Optional				
Test Date [YYYY-MM-DD].....:				—
Test Voltage applied [V] .....:				—
Size of module [m²] .....:				—
Required Resistance [MΩ].....:				—
Sample #	Measured	Dielectric breakdown		Result
	[MΩ]	Yes (description)	No	

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

TABLE 15: MQT 12 - Humidity freeze 10 test		
Test Date [YYYY-MM-DD] start/end .....:		—
Total cycles (10) ..... :		—
Applied current (A) ..... :		—
Dwell time at high temperature ..... :		—
Dwell time at low temperature..... :		—
Sample #	Open circuits (yes/no)	—
Supplementary information:		

TABLE 15.1: MQT 01 - Visual inspection after humidity freeze 10 test		
Test Date [YYYY-MM-DD].....:		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 15.2: MQT 15 - Wet leakage current test after humidity freeze 10 test			
Test Date [YYYY-MM-DD].....:			—
Test Voltage applied [V] .....:			—
Solution temperature [°C]…….:			—
Size of module [m²] .....:			—
Solution resistivity [Ω cm].....:			—
Sample #	Measured [MΩ]	Limit [MΩ]	Result
Supplementary information:			

TABLE 15.3: MQT 02 - Maximum power determination after humidity freeze 10 test -Optional		
Test Date [YYYY-MM-DD].....:		—
Module temperature [°C].....:		—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Irradiance [W/m²) .....:						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]
Supplementary information:						

TABLE 15.4: MQT 03 Insulation test after humidity freeze 10 test) -Optional					
Test Date [YYYY-MM-DD].....:					—
Test Voltage applied [V] .....:					—
Size of module [m²] .....:					—
Required Resistance [MΩ].....:					—
Sample #	Measured	Required	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
Supplementary information:					

TABLE 16: MQT 14.1 Retention of junction box on mounting surface		
Test Date [YYYY-MM-DD] start/end .....:		—
Sample #		—
Supplementary information:		

TABLE 16.1: MQT 01 - Visual inspection after retention of junction box on mounting surface		
Test Date [YYYY-MM-DD]..... :		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 16.2: MQT 15 - Wet leakage current test after retention of junction box on mounting surface		
Test Date [YYYY-MM-DD]..... :		—
Test Voltage applied [V] ..... :		—
Solution temperature [°C].....:		—
Size of module [m²]		—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Solution resistivity [Ω cm]..... :			—
Sample #	Measured [MΩ]	Limit [MΩ]	Result
Supplementary information:			

TABLE 17: MQT 11 - Thermal cycling 200 test			
Test Date [YYYY-MM-DD] start/end .....:			—
Total cycles (200).....:			—
Weight attached (N) .....:			—
Applied current (A) .....:	During the heat up cycle from – 40 °C to 80 °C		—
	Other stages		—
Dwell time at high temperature .....:			—
Dwell time at low temperature.....:			—
Sample #	Open circuits (yes/no)		—
Supplementary information:			

TABLE 17.1: MQT 01 - Visual inspection after thermal cycling 200 test		
Test Date [YYYY-MM-DD].....:		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 17.2: MQT 15 - Wet leakage current test after thermal cycling 200 test			
Test Date [YYYY-MM-DD].....:			—
Test Voltage applied [V] .....:			—
Solution temperature [°C].....:			—
Size of module [m²] .....:			—
Solution resistivity [Ω cm].....:			—
Sample #	Measured [MΩ]	Limit [MΩ]	Result

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

TABLE 18: MQT 13 - Damp heat 1000 test		
Test Date [YYYY-MM-DD] start/end .....:		—
Total hours (1000h) .....:		—
Sample #		—
Supplementary information:		

TABLE 18.1: MQT 01 - Visual inspection after damp heat 1000 test		
Test Date [YYYY-MM-DD].....:		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 18.2: MQT 15 - Wet leakage current test after damp heat 1000 test			
Test Date [YYYY-MM-DD].....:			—
Test Voltage applied [V].....:			—
Solution temperature [°C].....:			—
Size of module [m²].....:			—
Solution resistivity [Ω cm].....:			—
Sample #	Measured [MΩ]	Limit [MΩ]	Result
Supplementary information:			

TABLE 18.3: MQT 02 - Maximum power determination after damp heat 1000 test - Optional							
Test Date [YYYY-MM-DD].....:							—
Module temperature [°C].....:							—
Irradiance [W/m²) .....:							—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

TABLE 18.4: MQT 03 - Insulation test after damp heat 1000 test - Optional					
Test Date [YYYY-MM-DD]..... :					—
Test Voltage applied [V] ..... :					—
Size of module [m²]					—
Sample #	Measured	Required Resistance	Dielectric breakdown		Result
	[MΩ]	[MΩ]	Yes (description)	No	
Supplementary information:					

TABLE 19: MQT 16 Static mechanical load test			
Sample # :			—
Design load(front side/ back side)..... :			—
Safety factors ..... :			—
Test Date [YYYY-MM-DD].....			—
Mounting method ..... :			—
Load applied to..... :	front side	back side	—
Mechanical load [Pa].....:			—
First cycle time (start/end).....:			—
Intermittent open-circuit (yes/no) .....:			
Second cycle time (start/end) .....:			—
Intermittent open-circuit (yes/no) .....:			
Third cycle time (start/end) .....:			—
Intermittent open-circuit (yes/no) .....:			
Supplementary information: may need to be performed with each mounting situation			

TABLE 19.1: MQT 01 - Visual inspection after static mechanical load test		
Test Date [YYYY-MM-DD].....:		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 19.2: MQT 15 - Wet leakage current test after static mechanical load test			
Test Date [YYYY-MM-DD]..... :			—
Test Voltage applied [V]..... :			—
Solution temperature [°C]..... :			—
Size of module [m²] ..... :			—
Solution resistivity [Ω cm]..... :			—
Sample #	Measured [MΩ]	Limit [MΩ]	Result
Supplementary information:			

TABLE 20: MQT 22 Bending test		
Test Date [YYYY-MM-DD]..... :		—
Sample # :		—
Specified radius of curvature ..... :		—
Bending radius ..... :		—
Total cycles..... :		—
Intermittent open-circuit (yes/no) ..... :		
Supplementary information: may need to be performed with each mounting situation		

TABLE 20.1: MQT 01 - Visual inspection after bending test		
Test Date [YYYY-MM-DD]..... :		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 20.2: MQT 15 - Wet leakage current test after bending test			
Test Date [YYYY-MM-DD]..... :			—
Test Voltage applied [V]..... :			—
Solution temperature [°C]..... :			—
Size of module [m²] ..... :			—
Solution resistivity [Ω cm]..... :			—
Sample #	Measured [MΩ]	Limit [MΩ]	Result
Supplementary information:			

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 21: MQT 17 - Hail impact test							
Test Date [YYYY-MM-DD]..... :							—
Sample #							—
Ice ball size [mm] ..... :	1	2	3	4	5	6	—
	7	8	9	10	11		
Ice ball weight [g] ..... :	1	2	3	4	5	6	—
	7	8	9	10	11		
Ice ball velocity [m/s]..... :	1	2	3	4	5	6	—
	7	8	9	10	11		
Number of impact locations ..... :							—
Supplementary information: (impact location descriptions)							

TABLE 21.1: MQT 01 - Visual inspection after hail impact test		
Test Date [YYYY-MM-DD].....:		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 21.2: MQT 15 - Wet leakage current test after hail impact test			
Test Date [YYYY-MM-DD]..... :			—
Test Voltage applied [V]..... :			—
Solution temperature [°C]..... :			—
Size of module [m²] ..... :			—
Solution resistivity [Ω cm] ..... :			—
Sample #	Measured [MΩ]	Required Resistance [MΩ]	Result
Supplementary information:			

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 22: MQT 21 -Potential induced degradation test			—
Test Date [MM/DD/YYYY] start/end.....:			—
Chamber air temperature (°C) ..... :			—
Chamber relative humidity (% RH) ..... :			—
Test duration hours (h) ..... :			—
Sample #	Applied voltage stress (V) and polarities		—
			—
			—
			—
			—
Supplementary information:			

TABLE 22.1: MQT 01 - Visual inspection after potential induced degradation test		
Test Date [YYYY-MM-DD].....:		—
Sample #	Nature and position of initial findings – comments or attach photos	—
Supplementary information:		

TABLE 22.2: MQT 15 - Wet leakage current test after potential induced degradation test			
Test Date [YYYY-MM-DD]..... :			—
Test Voltage applied [V].....:			—
Solution temperature [°C].....:			—
Size of module [m²] ..... :			—
Solution resistivity [Ω cm] .....:			—
Sample #	Measured [MΩ]	Required Resistance [MΩ]	Result
Supplementary information:			

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE 23: MQT 19.2: Final stabilization							
TABLE 23.1: MQT 06.1: Performance at STC before final stabilization							
Test Date [YYYY-MM-DD]..... :							—
Test method..... :	☐ Solar simulator ☐ Natural sunlight						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Supplementary information:							

TABLE 23.2: MQT 19.1 Final Stabilization procedure							
☐IS 14286 (Part 1/Sec 2) ☐ IS 14286 (Part 1/Sec 3) ☐ IS 14286 (Part 1/Sec 4)							
Light exposure method:			☐ Solar simulator ☐ Natural sunlight				
Stabilization criterion x per IS 14286 (Part 1/Sec x):							
Sample #		Test Date (YYYY-MM-DD) start/end..:					
Test cycle	Integrated irradiation (kWh/m²)	Irradiance (W/m²)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	$(P_{max} – P_{min}) / P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end					
Test cycle	Integrated irradiation (kWh/m²)	Irradiance (W/m²)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	$(P_{max} – P_{min}) / P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	(P_{max} – P_{min}) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end..:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	(P_{max} – P_{min}) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	(P_{max} – P_{min}) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end..... :					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	(P_{max} – P_{min}) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

4						—	—
Sample #		Test Date (YYYY-MM-DD) start/end					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	($P_{max} – P_{min}$) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Supplementary information:							
☐ Other stabilization procedures							
Sample #	Test Date (YYYY-MM-DD) start/end						
Test method description:							
Supplementary information: see Annex 3 for verification of this alternative stabilization procedure							

TABLE 23.3: MQT 19.2: Final stabilization		
☐IS 14286 (Part 1/Sec 1)		
☐Method 1		
Stress-specific stabilization – BO LID (MQT 19.3)		
Test Date [YYYY-MM-DD]..... :		—
Applied current (A) ..... :		—
Module temperature [°C]..... :		—
Total hours (48h) ..... :		—
Performance at STC after final stabilization— for monofacial modules		
Test Date [YYYY-MM-DD]..... :		—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight	—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result

Performance at BNPI after final stabilization — for bifacial modules		—
Test Date [YYYY-MM-DD] ..... :		—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight	—

Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (LabGateNo.1)	Power Degradation	Result

Supplementary information:	
☐**Method 2**	—
Performance at STC before final stabilization— for monofacial modules	—
Test Date [YYYY-MM-DD] ..... :	—
Test method ..... : ☐ Solar simulator ☐ Natural sunlight	—

Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result

Performance at BNPI before final stabilization — for bifacial modules		—
Test Date [YYYY-MM-DD] ..... :		—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight	—

Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result

Supplementary information: This module was not stabilized, and therefore the amount of degradation observed may be larger than what would have been obtained if the module had been stabilized, due to destabilization artifacts.

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

If Power Degradation≥5%, then perform stress-specific stabilization MQT 19.3 in method 1									
Stress-specific stabilization – BO LID (MQT 19.3)									
Test Date [YYYY-MM-DD]..... :									—
Applied current (A) ..... :									—
Module temperature [°C]..... :									—
Total hours (48h) ..... :									—
Performance at STC after final stabilization — for monofacial modules									
Test Date [YYYY-MM-DD]..... :									—
Test method..... :	☐ Solar simulator ☐ Natural sunlight								—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result
Performance at BNPI after final stabilization — for bifacial modules									
Test Date [YYYY-MM-DD]..... :									—
Test method..... :	☐ Solar simulator ☐ Natural sunlight								—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result
Supplementary information:									
TABLE 23.4: MQT 19.2: Final stabilization									
☐**Method 3**									
Test Date (YYYY-MM-DD) start/end..... :									—
Test duration (h)..... :									—
Module temperature [°C] ..... :									—
UV irradiance (280-400nm) [W/m²] ..... :									—
UV dose (280-320nm) [kWh/ m²] ..... :									—
UV dose (280-400nm) [kWh/ m²] ..... :									—
Side exposed ..... :	☐ Front side ☐ Rear side								—
Module operation condition .....:	☐ Short circuited ☐ Open circuited								—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information: For bifacial modules, the irradiance shall be applied to the rear side, whereas for monofacial modules, the irradiance shall be applied to the front side.

Performance at STC after final stabilization— for monofacial modules

Test Date [YYYY-MM-DD]..... : —

Test method..... : ☐ Solar simulator ☐ Natural sunlight —

Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result

Performance at BNPI after final stabilization — for bifacial modules

Test Date [YYYY-MM-DD]..... : —

Test method..... : ☐ Solar simulator ☐ Natural sunlight —

Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result

Supplementary information:

☐**Method 4**

Performance at STC before final stabilization— for monofacial modules

Test Date [YYYY-MM-DD]..... : —

Test method..... : ☐ Solar simulator ☐ Natural sunlight —

Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Performance at BNPI before final stabilization — for bifacial modules									
Test Date [YYYY-MM-DD] ..... :									—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight								—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result
Supplementary information: This module was not stabilized, and therefore the amount of degradation observed may be larger than what would have been obtained if the module had been stabilized, due to polarization artifacts									
If Power Degradation≥5%, then perform method 3 final stabilization									
Method 3									
Test Date [YYYY-MM-DD] ..... :									—
Test duration (h) ..... :									—
Module temperature [°C] ..... :									—
UV irradiance (280-400nm) [W/m²] ..... :									—
UV dose (280-320nm) [kWh/ m²] ..... :									—
UV dose (280-400nm) [kWh/ m²] ..... :									—
Side exposed ..... :	☐ Front side ☐ Rear side								—
Module operation condition ..... .:	☐ Short circuited ☐ Open circuited								—
Performance at STC after final stabilization — for monofacial modules									
Test Date [YYYY-MM-DD] ..... :									—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight								—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Performance at BNPI after final stabilization — for bifacial modules									
Test Date [YYYY-MM-DD]..... :									—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight								—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation	Result
Supplementary information:									

TABLE 23.5: MQT 06.1: Final Performance at STC									
Test Date [YYYY-MM-DD]..... :									—
Test method	☐ Solar simulator ☐ Natural sunlight								—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation [%]	Result
Supplementary information: Pmax [W] (Lab_GateNo.1) is calculated by considering the reproducibility *r* of control module.									

For bifacial modules							
TABLE 23.6: MQT 06.1 ini: Performance at STC after final stabilization (Front side)							
Test Date [YYYY-MM-DD].....:							—
Test method .....:	☐ Solar simulator ☐ Natural sunlight						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

TABLE 23.7: MQT 06.1 ini: Performance at STC after final stabilization (Back side)										
Test Date [YYYY-MM-DD] ..... :										—
Test method	☐ Solar simulator ☐ Natural sunlight									—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	φI_{sc}	φV_{oc}	φP_{max}	Result

Supplementary information:

TABLE 23.8: MQT 06.1: Final Performance at BNPI									
Test Date [YYYY-MM-DD] ..... :									—
Test method	☐ Solar simulator ☐ Natural sunlight								—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Pmax [W] (Lab Gate No.1)	Power Degradation [%]	Result

Supplementary information: Pmax [W] (Lab_GateNo.1) is calculated by considering the reproducibility *r* of control module.

TABLE 23.9: MQT 03 fin: Final Insulation test		
Test Date [YYYY-MM-DD] ..... :		—
Test Voltage applied [V] ..... :		—

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Size of module [m²] ..... :					—
Sample #	Required	Measured	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
Supplementary information:					

TABLE 23.10: MQT 15 fin: Final Wet leakage current test			
Test Date [YYYY-MM-DD] ..... :			—
Test Voltage applied [V] ..... :			—
Solution temperature [°C]..... :			—
Size of module [m²] ..... :			—
Solution resistivity [Ω cm]..... :			—
Sample #	Measured [MΩ]	Limit [MΩ]	Result
Supplementary information:			

Annex 1: Critical components information

5.3.2 Internal wiring		
Cell connector		
Manufacturer:	Type:	Material:
Thickness [µm]:	Dimension [mm]:	Coatings:
Supplementary Information:		
String connector		
Manufacturer:	Type:	Material
Thickness [µm]:	Dimension [mm]:	Coatings:
Supplementary Information:		
5.3.3 External wiring and cables		
Cables		
Manufacturer:	Type:	Material:
Diameter [mm²]:	Length [mm]:	Max. Temperature:
Certified: ☐ Yes / ☐ No	Standards:	Others:
Certifier and Cert. No.	☐ IEC 62930 ☐ EN 50618	
Supplementary Information:		
5.3.4 Connectors		
Manufacturer:	Type:	Class:
Max. Voltage:	Max. Current:	Max. Temperature:
IP-rating:	Locked:	
	☐ Yes / ☐ No	
Certified: ☐ Yes / ☐ No	Standards:	Others:
Certifier and Cert. No.	☐ IEC 62852	
Supplementary Information:		
5.3.5 Junction boxes		
Manufacturer:	Type:	Class:
IP-rating:	Dimensions (l x w x h) [mm²]:	Weight [g]:
Max. Voltage:	Max. Current:	Max. Temperature:
Electrical Termination cell side:	Electrical Termination cell side:	Number of Bypass Diodes
Soldered ☐ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	Soldered ☐ Crimped ☐ Welded ☐ Screwed ☐ Screwless ☐	
Potted:	Certified: ☐ Yes / ☐ No	Standards:
☐ Yes / ☐ No	Certifier and Cert. No.	☐ IEC 62790
Supplementary Information:		

5.3.6 Frontsheets and backsheets		
Frontsheet		
Used as: ☐ Basic Insulation ☐ Reinforced Insulation		
Total Dimensions (width x length) [mm]:		
Material:	Manufacturer:	Type:
Glass		
Thickness [mm]:	Heat strength.: ☐ Yes / ☐ No	Coating: ☐ Yes / ☐ No
	☐ Tempered ☐ Heat strengthened ☐ Annealed	Description
Structured: ☐ Yes / ☐ No	Certified: ☐ Yes / ☐ No	Standards:
Description	Certifier and Cert. No.	
Supplementary Information:		
Single layer: ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Supplementary Information:		
Multi-layer ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Total Thickness [mm]:	No of layers:	
Layer No. 1 (air side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Layer No. 2	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Layer No. 3	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:

Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Layer No. n (Encapsulation side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Supplementary Information:		
Backsheet		
Used as: ☐ Basic Insulation ☐ Reinforced Insulation		
Material:	Manufacturer:	Type:
Glass		
Thickness [mm]:	Heat strength.: ☐ Yes / ☐ No	Coating: ☐ Yes / ☐ No
	☐ Tempered ☐ Heat strengthened ☐ Annealed	Description
Structured: ☐ Yes / ☐ No	Certified: ☐ Yes / ☐ No	Standards:
Description	Certifier and Cert. No.	
Supplementary Information:		
Single layer: ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Supplementary Information:		
Multi-layer ☐	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Total Thickness [mm]:	No of layers:	
Layer No. 1 (air side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C	☐ I

	☐ TI °C ☐ RTI °C	☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Layer No. 2	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Layer No. 3	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Layer No. n (Encapsulation side)	Used as: ☐ Basic Insulation ☐ Reinforced Insulation	
Material:	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Supplementary Information:		
5.3.7 Insulation barriers / Edge sealant		
Used as: ☐ Functional ☐ Basic Insulation ☐ Reinforced Insulation		
Total Dimensions (width x length) [mm]:		
Material:	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Supplementary Information:		
5.3.9 Encapsulants		
Used as: ☐ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Total Dimensions (width x length) [mm]:		
Material: (Frontsheet side)	Manufacturer:	Type:

IS 14286 (Part 2):2023

Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	

Material: (Backsheet side)	Manufacturer:	Type:
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Supplementary Information:		

5.5.2.3 Polymeric materials used as electrical insulation		
Location:		
Application ☐ External part ☐ Support of live parts ☐ Mechanical functions		
Used as: ☐ Functional ☐ Basic Insulation ☐ Reinforced Insulation		
Material:	Manufacturer:	Type:
Flammability class:		
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Supplementary Information:		
Location:		
Application ☐ External part ☐ Support of live parts ☐ Mechanical functions		
Used as: ☐ Functional ☐ Basic Insulation ☐ Reinforced Insulation		
Material:	Manufacturer:	Type:
Flammability class:		
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Colour:	Certified ☐ Yes / ☐ No	Standards:
	Certifier and Cert. No.	
Supplementary Information:		

5.3.10 Bypass Diodes		
Manufacturer:	Type:	
Nominal current of diode I_F (A)		
R_{THJ-C} (K/W) / R_{THJ-L} (K/W)		

Max. T_J (°C)		
Max. V_F at I_F (V)		
Supplementary Information:		

5.4.2 / 5.4.4 Screws			
Application	Kind of screw:	Dimensions (diameter/length)	Material
Supplementary Information:			

5.4.3 Rivets		
Application	Dimensions (diameter/length)	Material:
Supplementary Information:		

5.4.6 Adhesives		
For Junction Boxes		
Manufacturer:	Type:	
Additional function as: ☐ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Supplementary Information:		
For Frames / Backrails		
Additional function as: ☐ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Manufacturer:	Type:	
Additional function as: ☐ Basic Insulation ☐ Reinforced Insulation ☐ N/A		
Thickness [mm]	Thermal Index:	Material Group:
	☐ RTE °C ☐ TI °C ☐ RTI °C	☐ I ☐ II ☐ III
Supplementary Information:		

5.5.3 Metallic Materials		
Frame / Corner joint / Backrail:		
Manufacturer:	Type:	Dimension

IS 14286 (Part 2):2023

Supplementary Information:		
Others:		
Manufacturer:	Type:	Dimension
Supplementary Information:		

Cell		
Kind of cell	Manufacturer:	Type:
☐ cSi ☐ CdTe ☐ aSi ☐ CiGs		
Thickness [µm]:	Dimension [mm]:	Number of busbars:
Supplementary Information:		

Cell fixing Tape						
No.	Material	Manufacturer	Type		Ratings	
1						
2						
3						

Annex 2: Test table for verifying other alternative stabilization procedure

Step 1: Alternative stabilization				
Test Date (YYYY-MM-DD) start/end:				—
Test method description:				—
	Sample	Sample	Sample	—
Power before alternative stabilization (W)				—
Power after alternative stabilization (W)				—
Supplementary information:				

Step 2: Light exposure								
☐ Solar simulator ☐ Natural sunlight								
Sample	Test Date (YYYY-MM-DD) start/end...................................:							
Test cycle	Light source	Integrated irradiation (kWh/m²)	Irradiance (W/m²)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	$(P_{max} – P_{min}) / P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—	—		—	—
1							—	—
2								
Supplementary information:								
Sample	Test Date (YYYY-MM-DD) start/end...........................:							
Test cycle	Light source	Integrated irradiation (kWh/m²)	Irradiance (W/m²)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	$(P_{max} – P_{min}) / P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—	—		—	—
1							—	—
2								
Supplementary information:								
Sample	Test Date (YYYY-MM-DD) start/end............................:							
Test cycle	Light source	Integrated irradiation (kWh/m²)	Irradiance (W/m²)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	$(P_{max} – P_{min}) / P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—	—		—	—
1							—	—
2								
Supplementary information:								

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Step 3: Stabilization determination				
	Sample	Sample	Sample	Result
Stable power P_{max1} after alternative stabilization (W)				
Stable power P_{max2} after light exposure (W)				
Power change P_{max2} to P_{max1} (%)				
Allowed power change P_{max2} to P_{max1} (%)				
Is alternative stabilization method valid? (Yes/No)				
Supplementary information:				

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Annex 3: Lower and higher output power modules

TABLE A.4.1 Performance at STC before initial stabilization (Front side)							
Test Date [YYYY-MM-DD] ..... :							—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Low 1							
Low 2							
High 1							
High 2							
Supplementary information: The limit value is calculated through considering the tolerance of rated label values and lab measurement uncertainty.							

TABLE A.4.2 Performance at STC before initial stabilization (Back side)							
Test Date [YYYY-MM-DD] ..... :							—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Low 1							
Low 2							
High 1							
High 2							
Supplementary information: The limit value is calculated through considering the tolerance of rated label values and lab measurement uncertainty.							

TABLE A.4.3 Performance at BNPI before initial stabilization							
Test Date [YYYY-MM-DD] ..... :							—
Test method ..... :	☐ Solar simulator ☐ Natural sunlight						—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Low 1							
Low 2							
High 1							
High 2							
Supplementary information: The limit value is calculated through considering the tolerance of rated label							

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict
values and lab measurement uncertainty.			

TABLE A.4.4: MQT 19.1 ini: Initial Stabilization procedure							
Light exposure method	☐ Solar simulator ☐ Natural sunlight						—
Stabilization criterion x per IS 14286 (Part 1/Sec x).....							—
Sample #	Low 1	Test Date (YYYY-MM-DD) start/end ..... :					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	($P_{max} – P_{min}$) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #	Low 2	Test Date (YYYY-MM-DD) start/end .....:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	($P_{max} – P_{min}$) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #	High 1	Test Date (YYYY-MM-DD) start/end .....:					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	($P_{max} – P_{min}$) / $P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—
Sample #	High 2	Test Date (YYYY-MM-DD) start/end ..... :					
Test cycle	Integrated irradiation (kWh/m^2)	Irradiance (W/m^2)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	($P_{max} – P_{min}$) / $P_{average}$ (%)	Stable (Yes/No)

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

Initial	—	—	—	—		—	—
1							
2							
3							
4						—	—

Supplementary information:		
☐ Other stabilization procedures		
Sample #	Test Date (YYYY-MM-DD) start/end .....:	
Low 1		
Low 2		
High 1		
High 2		
Test method description:		
Supplementary information: see Annex 3 for verification of this alternative stabilization procedure		

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE A.4.7: MQT 6.1 Performance at STC after initial stabilization (Front side)							
Test Date [YYYY-MM-DD] ..... :							—
		Lower end power class		Higher end power class			—
P_{max}(lab) (W) ..... :		≤_____	≥ _____	≥ _____,			—
$\bar{P}_{max}$(lab) (W) ..... :		≥ _____,		≥ _____,			—
P_{max4}(la) (W) ..... :							
V_{oc}(lab) (V) ..... :		≤ _____,		≤ _____,			—
I_{sc} (lab) (A) ..... :		≤ _____,		≤ _____,			—
Test method .....:		☐ Solar simulator		☐ Natural sunlight			—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Low 1							
Low 2							
High 1							
High 2							
Supplementary information: The limit value is calculated through considering the tolerance of rated label values and lab measurement uncertainty.							

TABLE A.4.8: MQT 6.1 Performance at STC after initial stabilization (Back side)							
Test Date [YYYY-MM-DD] ..... :							—
		Lower end power class		Higher end power class			—
P_{max}(lab) (W) ..... :		≤ _____,	≥_____	≥ _____,			—
$\bar{P}_{max}$(lab) (W) ..... :		≥ _____,		≥ _____,			—
V_{oc}(lab) (V) ..... :		≤ _____,		≤ _____,			—
I_{sc} (lab) (A) ..... :		≤ _____,		≤ _____,			—
Test method .....:		☐ Solar simulator		☐ Natural sunlight			—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Low 1							
Low 2							
High 1							
High 2							
Supplementary information: The limit value is calculated through considering the tolerance of rated label values and lab measurement uncertainty.							

IS 14286 (Part 2):2023			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE A.4.9: MQT 6.1 Performance at BNPI after initial stabilization							
Test Date [YYYY-MM-DD] ..... :							—
		Lower end power class		Higher end power class			—
P_{max}(lab) (W) ..... :		≤ _____,	≥_____	≥ _____,			—
$\bar{P}_{max}$(lab) (W) ..... :		≥ _____,		≥ _____,			—
V_{oc}(lab) (V) ..... :		≤ _____,		≤ _____,			—
I_{sc} (lab) (A) ..... :		≤ _____,		≤ _____,			—
Test method .....:		☐ Solar simulator		☐ Natural sunlight			—
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
Low 1							
Low 2							
High 1							
High 2							
Supplementary information: The limit value is calculated through considering the tolerance of rated label values and lab measurement uncertainty.							

Annex 4: List of measurement equipment

Application	Identification	Description

----------End of TRF----------